

MASTHEAD ELECTRIC ILLUMINATION.

An interesting detail of naval operations in the supposed case of a war between England and France has lately appeared in *The Engineer*, London, from the pen of W. Laird Clowes, under the title of "The Captain of the Mary Rose," a tale of to-morrow. It gives particulars of various supposititious naval combats, and brings into clear light the defects as well as the powers of modern war vessels of all classes. The story is well illustrated. Among the engravings is one representing a plan for masthead electric lighting in which a zone of light is made to illuminate the waters in all directions around the ship of war, while the vessel itself remains in deep shadow. Concerning this device our author says:

"Masthead electric lights of novel design are being fitted to some of the larger battleships. These are so arranged as to shed a zone of illumination all around the vessel, but to leave the craft herself in comparative darkness, and it is confidently expected that they will be of great value should our squadrons be obliged to anchor at night within raiding distance of the enemy's torpedo boats. Some experienced officers, however, are of opinion that a ship which desires to remain exempt from attack should on no account exhibit a light of this kind, since it must of necessity be visible from a considerable distance to the foe, and they do not hesitate to say that, even if they be supplied with it, they will not use it. The advantage of the light lies in the fact that no ship so long as she employs it can possibly be closely approached by any enemy that does not expose himself to a very dangerous extent. On the other hand, it is pointed out that the apparatus is large, and offers so fine a mark for machine gun fire that it could doubtless be easily extinguished by moderately good gunners at 3,000 yards, or even more. Experts here are loud in their regrets that this device, which is quite new, in common with other electric lighting devices which are much older, has not been properly experimented with in peace time, and that, in consequence, no certainty exists as to either its practical utility or its vulnerability."

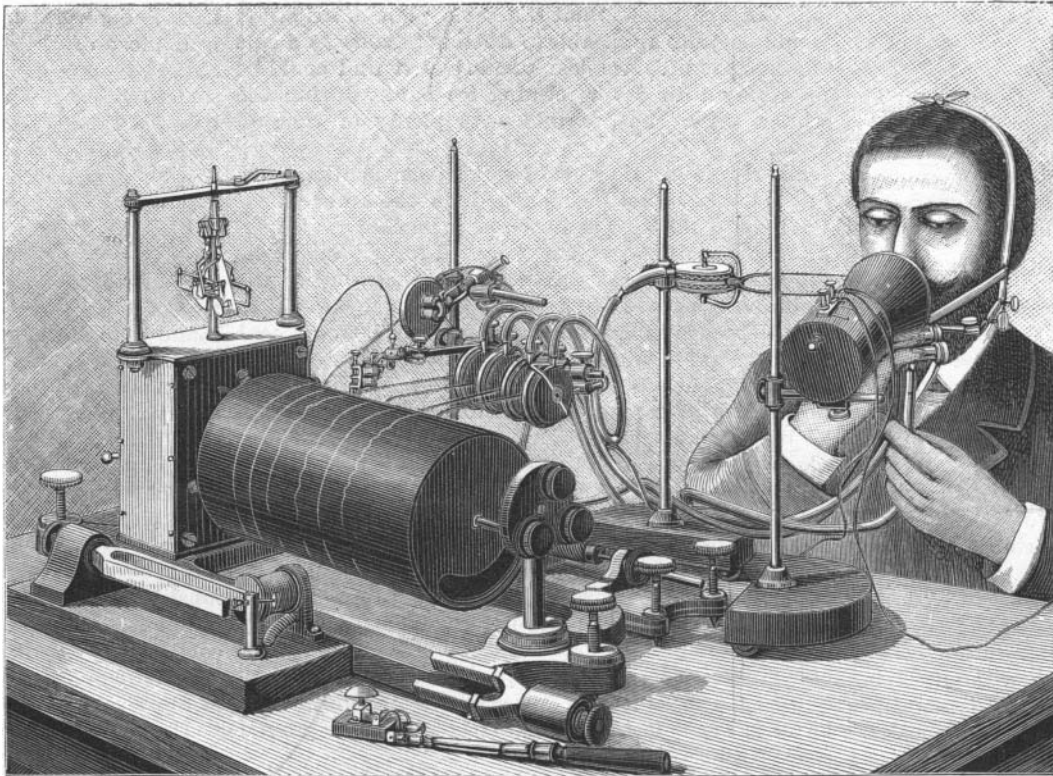
THE INSCRIPTION OF SPEECH.

Abbot Rousselot, professor at the Carmelite School, has very recently presented to the Faculty of Letters of Paris a thesis for doctor's degree which is apparently of a very special interest, for it treats of the "phonetic modification of language as studied in the patois of a family of Cellesrouin (Charente);" but this work, at first sight so limited, has a wide range, for the author definitely lays down therein the bases of a new

description of speech is solved. The lines are inscribed upon the Verdin registering apparatus figured herewith. This, as well known, consists essentially of a cylinder upon which is fastened a sheet of glazed paper blackened with the smoke of a wax taper. A clockwork, with a Foucault regulator, permits of making it revolve with a speed that may be regulated at will. In front of the cylinder, upon a horizontal rod, is fixed a Marey drum and lever, made of a metallic capsule closed with sheet rubber. Against the rubber there bears a metallic plate with which is connected a horn lever that thus follows all the movements of the plate and rubber. The extremity of this lever rests upon the blackened sheet and removes the lampblack and thus draws a white line upon it. On another hand, there is an aperture in the drum into which a rubber tube may be fitted.

Evidently, every time that, for any cause whatever, the air contained in the rubber tube enters into vibration, the vibrations will be communicated to the air of the drum, and after this the rubber and then the plate and lever will enter into motion. If the cylinder is revolving at the same time, the line that will be inscribed thereon by the point of the lever, instead of being straight, will become a tracing—a tracing of the vibrations.

Now, if we reflect that speech is a motion and that a sound, a voice, is air that issues from the mouth and nose in vibrating under the action of the phonic organs, we shall understand the use to which the apparatus just described may be put. Abbot Rousselot does not, of course, make it note speech itself in all its complexity, but, one by one or simultaneously, all the motions that compose it. Let us begin with those of the larynx. It is here, in fact, that the first noises are produced when the air is expelled from the lungs. To the extremity of the tube that ends in the drum is adapted a metallic capsule about half an inch in diameter, which one applies to the throat, in the lateral curve of the thyroid cartilage, and then speaks. Then the vibrations of the larynx, transmitted through the skin to the column of air o

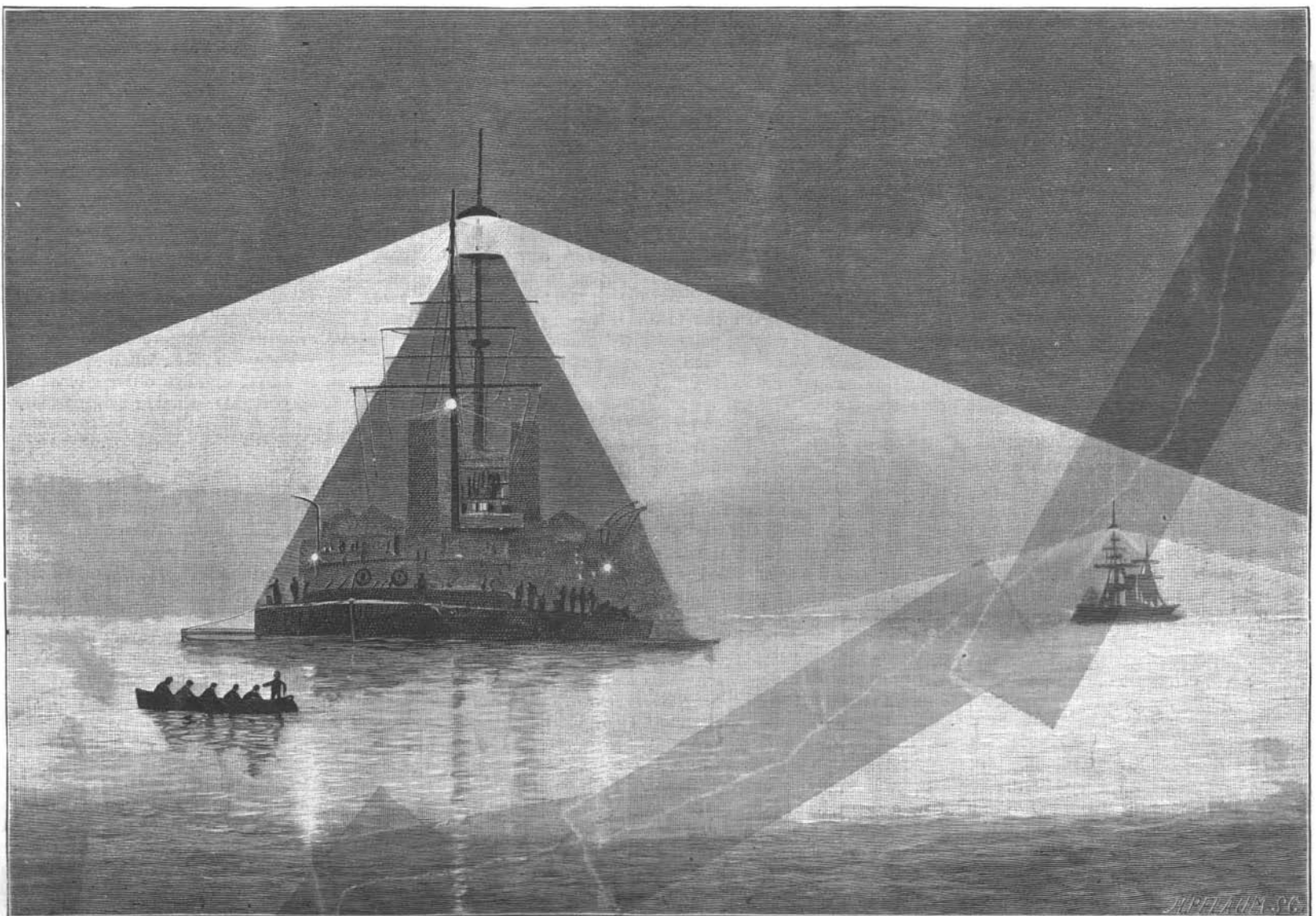


ABBOT ROUSSELOT'S APPARATUS FOR INSCRIBING SPEECH.

science—experimental linguistics. Our readers already know of the important results obtained by Messrs. Rosapelly and Marey in their laboratories. It is by the aid of their labors and those of a few others, Scott, Barlow, etc., that Abbot Rousselot, in preserving the instruments of his predecessors, such as they are, in correcting them, or in devising new systems, has succeeded in creating the series of apparatus necessary for registering, one by one, the motions whose ensemble constitutes a word or a phrase.

It is to be foreseen that the ingenuity of his successors, his own even, will still further improve these new apparatus; but at present the experiments made suffice to show that the problem of the mechanical in-

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